GIS GLOSSARY

This is a brief listing of some of the important terms used to describe various GIS functions.

Annotation - Descriptive text used to label coverage features. Information stored for annotation includes a text string, the location at which it is displayed, and a text symbol (color, font, size, etc.) for display. More than one subclass of annotation can be created for a coverage.

AML - The ARC Macro Language. A high-level, algorithmic language that provides full programming capabilities and a set of tools for building menus to tailor user interfaces for specific applications.Features include the ability to create on-screen menus from text files, to use and assign variables, and to get and use map or page unit coordinates. AML includes an extensive set of directives and in-line functions that can be used interactively or in AML programs (macros) as well as functions that report on the status of ARC/INFO command parameters.

Arc - 1. A string of x,y coordinate pairs (vertices) that begin at one location and end at another. Connecting the arc's vertices creates a line. 2. A coverage feature class used to represent linear features and polygon boundaries. One line feature can contain many arcs. Arcs are topologically linked at their endpoints (nodes) and to the areas (polygons) on either side. Arcs start and end at a node and can define areas to the left and right of their direction of travel (determined arbitrarily at the time of data capture). The descriptive attributes of arcs are stored in the arc attribute table (AAT).

Area - A closed figure (polygon). A homogeneous area bounded by one or more arc features. Examples: states, counties, lakes, land use areas.

ARC/INFO - A software tool used for Geographic Information Systems GIS construction and analysis developed by ESRI (Environmental Systems Research Institutes, Inc.), Redlands, CA. Current products include: ARC/INFO, PC-ARC/INFO, ARCVIEW. Leading high-end (UNIX) commercial vector GIS.

ArcView GIS is a desktop geographic information system. With ArcView GIS you can create intelligent, dynamic maps using data from virtually any source and across most popular computing platforms. ArcView GIS provides the tools to let you work with maps, database tables, charts, and graphics all at once. You can also use multimedia links to add pictures, sound, and video to your maps.

ASCII - An acronym for American Standard Code for Information Interchange. It is pronounced "askee". ASCII is a fixed-length, binary-based code widely used to represent data for processing and communications. It is an internationally recognized convention for representing letters and numbers of the Roman alphabet in the binary rotation that all computers use (e.g., a byte with a value of 77 represents a capital M). Text files, such as those created with the text editor of a computer system, are often referred to as ASCII files.

Attribute - 1. A characteristic of a geographic feature described by numbers or characters, typically stored in tabular format, and linked to the feature by a user-assigned identifier (e.g., the attributes of a well, represented by a point, might include depth, location, and gallons-per-minute). 2. A numeric, text, or image data field in a relational database table that describes a spatial feature such as a point, line, node, area, or cell.

Basemap - A map showing planimetric, topographic, geological, political, and/or cadastral information that may appear in many different types of maps. The base map information is drawn with other types of changing thematic information. Base map information may be as simple as major political boundaries, major hydrographic data, and major roads. The changing thematic information may be bus routes, or population distribution.

BGN - Board on Geographic Names. The official U.S. body created in 1890 to provide for uniform usage of geographic names throughout the Federal Government. BGN operates through several committees to standardize names of geographic features in the U.S., foreign areas, Antarctica, and undersea areas. Names of geographic features outside the U.S. have been published in a series of BGN gazetteers. Universal Transverse Mercator UTM grid coordinates are included.

Buffer - A zone of a specified distance around coverage features.

CAD - Computer-Aided Design. A CAD system is a combination of hardware and software that enables the user to produce graphics and drafting projects through the use of computers. CAD systems allow the user to edit and display designs from any angle or view with the just the click of a button. A feature never available to analog drafting.

Cartography - The art of graphically expressing known physical features of the Earth onto a map.

Cell - The basic element of spatial information in a grid data set. A group of cells forms a grid and storevalues that can be related to a table in Arc/Info.

Coordinate System - A system used to measure horizontal and vertical distances on a planimetric map; in Arc/Info, a system with units and characteristics defined by a map projection.

Coverage - A digital version of a map forming the basic unit of vector data storage in ARC/INFO. A coverage usually represents a single theme, or layer, such as roads, street lights, streams or land use.

Data dictionary - A facility that informs users and programmers about characteristics of data, attributes, or programs in a database or a computer system.

Datum - A set of parameters and control points used to accurately define the three-dimensional shape of the earth (e.g., as a spheroid). The corresponding datum is the basis for a planar

coordinate system. For example, the North American datum for 1983 (NAD83) is the datum for map projections and coordinates within the United States and throughout North America.
DCW - An acronym for Digital Chart of the World. The DCW is a 1700 megabyte database of vector geographic information. It provides global coverage of topographic information equivalent in detail to a 1:1,000,000 scale map.

DEM - Digital Elevation Model format (U.S. Geological Survey) 1. A raster storage method developed by the U.S. Geological Survey (USGS) for elevation data. 2. The format of the USGS elevation data sets. 3. A topographic surface arranged in a data file as a set of regularly-spaced x, y, z locations where z represents elevation.

Digitizing - A means of converting or encoding map data that are represented in analog form into digital information of x and y coordinates.

DLG - 1. Digital Line Graph files from the U.S. Geological Survey (USGS), including data from the base map categories such as transportation, hydrography, contours, and public land survey boundaries. 2. The digital format standards published by USGS for exchanging cartographic data files and for which the USGS delivers Digital Line Graph data sets.

DTM - (Digital Terrain Model). A computer graphics software technique for converting point elevation data into a terrain model displayed as a contour map, sometimes as a three-dimensional "hill and valley" grid view of the ground surface.

DXF - (Digital eXchange Format) 1. ASCII text files defined by Autodesk, Inc. Autodesk, Inc. (Sausalito, CA) at first for CAD, now showing up in third-party GIS software. 2. An intermediate file format for exchanging data from one software package to another, neither of which has a direct translation for the other but where both can read and convert DXF data files into their format. This often saves time and preserves accuracy of the data by not reautomating the original. 3. A format for storing vector data in ASCII or binary files; used by AutoCAD and other CAD software and convertible to ARC/INFO coverages.

Edge Match - An editing procedure to ensure that all features that cross map sheets have the same edge locations.

FACC - Feature and Attribute Coding Catalog. Coding scheme for features, their attributes, and attribute values.

FGDC - Federal Geographic Data Committee. A group of individuals representing different U.S. Government agencies that provide or handle digital geographic data. Housed in the Department of the Interior, the FGDC is chartered to facilitate information and data sharing, and to coordinate federal activities in the geodata acquisition arena.

FGDC Content Standards - Developed by the Federal Geographic Data Committee for information that the National Spatial Data Infrastructure(NSDI) clearinghouse-based geodata bibliographic records should include.

File - A set of related information that a computer can access by a unique name (e.g., a text file, a data file, a DLG file). Files are the logical units managed on disk by the computer's operating system. Files may be stored on tapes or disks.

Format - The pattern into which data are systematically arranged for use on a computer. A file format is the specific design of how information is organized in the file. For example, ARC/INFO has specific, proprietary formats used to store coverages; DLG, DEM, and TIGER are geographic data sets in particular formats available for many parts of the United States.

Geocode - The process of identifying a location as one or more *x,y* coordinates from another location description such as an address.

Georeference - To establish the relationship between page coordinates on a planar map and known real-world coordinates.

Geographic Information System (GIS) - Describes any automated system for spatially managing and analyzing geographic information.

Geographical Resource Analysis Support System (GRASS) - A public-domain raster GIS modeling product of the US Army Corp of Engineer's Construction Engineering research Laboratory (CERL).

Global Positioning System (GPS) - A satellite-based device that records x,y,z coordinates and other data. This device can be used in the field to record data while driving or hiking. The ground locations are calculated by signals from the satellites.

Graphical User Interface (GUI) - A graphical method of controlling how a user interacts with a computer to perform various tasks. Instead of issuing commands at a prompt, the user performs desired tasks by choosing from 'a dashboard' of options presented by the GUI on the display screen. These are in the form of pictorial buttons (icons) and lists. The user interacts with the system using a mouse to point-and-click. Some GUI tools are dynamic and the user must manipulate a graphical object on the screen to invoke a function; for example, moving a slider bar back and forth to determine the value of a parameter for a particular operation (e.g., setting the scale of a map).

INFO - A tabular DBMS used by Arc/Info to store and manipulate feature attribute and related tables.

Latitude/Longitude - A geodetic coordinate reference system used to measure locations on the Earth's surface. Latitude and longitude are angles measured from the Earth's center to locations on the Earth's surface. Latitude measures angles in a north-south direction. Longitude measures angles in the east-west direction.

Layer - A logical set of thematic data described and stored in a map library. Layers organize a map library by subject matter (e.g., soils, roads, and wells), and extend over the entire geographic area defined by the geographic extents of the data set.

Line - A set of ordered coordinates that represent the shape of geographic features too narrow to be displayed as an arc, or linear features with no area.

Map - An abstract representation of the physical features of a portion of the Earth's surface graphically displayed on a planar surface. Maps display signs, symbols, and spatial relationships among the features. They typically emphasize, generalize, and omit certain features from the display to meet design objectives.

Map Projection - A systematic conversion of locations on the Earth's surface from spherical to planar coordinates. Because the earth is three-dimensional, some method must be used to depict a map in two dimensions. Some projections preserve shape; others preserve accuracy of area, distance, or direction. However, any such representation distorts some parameter of the Earth's surface be it distance, area, shape, or direction.

Metadata - Information that describes data, or the bibliographic record that defines a data set. See also FGDC Content Standards.

Neatline - A border line commonly drawn around the extent of a map.

Node - 1. The beginning and ending locations of an arc. A node is topologically linked to all arcs that meet at the node. The point at which arcs (lines) in a polygon network connect. Nodes carry information about topology of the polygons.

Pathname - The path to a file or directory location on a disk. Pathnames are always specific to the computer operating system. Computer operating systems use directories and files to organize data. Directories are organized in a tree structure; each branch on the tree represents a subdirectory or file. Pathnames indicate locations in this hierarchy.

Plotter - An output device used for drawing graphs and diagrams.

Point - 1. A single x,y coordinate that represents a geographic feature too small to be displayed as a line or area; for example, the location of a mountain peak or a building location on a small-scale map. 2. A label point feature in a coverage. In ARC/INFO, label points are used either to represent point features in a point coverage or to assign Ids to polygons in a polygon coverage.

Polygon - A closed plane figure with three or more sides. In GIS, any closed plane figures, such as parcels, boundaries, etc.

Raster - Data displayed as discrete picture elements (pixels). A cellular data structure composed of rows and columns. Groups of cells represent features. The value of each cell represents the value of the feature. Image data is stored using this structure.

RDBMS - Relational database management system. A database management system with the ability to access data organized in tabular files that can be related to each other by a common field (item). An RDBMS has the capability to recombine the data items from different files, providing powerful tools for data usage.

Registration - The process of making the location of digital data conform to that of another digital data set.

Remote sensing - Acquiring information about an object without contacting it physically. Methods include aerial photography, radar, and satellite imaging.

Resolution - 1. A term referring to the sharpness of the images on an output medium. 2. Resolution is the accuracy at which a given map scale can depict the location and shape of map features. For example, at a map scale of 1:63,360 (1 inch = 1 mile), features smaller than .10-mile long or wide only measure .10-inch wide or long on the map. The larger the map scale, the higher the possible resolution. As map scale decreases, resolution diminishes and feature boundaries must be smoothed, simplified, or not shown at all. For example, small areas may have to be represented as points. 3. Size of the smallest feature that can be represented in a surface.

Route - A feature class in ARC/INFO that is part of the route-system data model. Routes represent linear features. A route is an ordered collection of sections. Sections define which arcs belong to the route, the direction of the route, and the measurement system used to address positions along it. The route attribute table (RAT) stores route attributes.

Scale - The extent of reduction needed to display a representation of the Earth's surface on a map. A statement of a measure on the map and the equivalent measure on the Earth's surface, often expressed as a representative fraction of distance, such as 1:24,000 (one unit of distance on the map represents 24,000 of the same units of distance on the Earth). Map scale can also be expressed as a statement of equivalence using different units; for example, 1 inch = 1 mile or 1 inch = 2,000 feet.

Scanning - The process of data input from hard copy to digital raster format by means of a device called a scanner. Some scanners also use software to convert raster data to vector data.

SDTS - Spatial Data Transfer Standard (i.e., Federal Information Processing Standard 173)

Server - A computer that manages shared devices, such as laser printers or high-capacity hard disks, on a local area network (LAN). At the CIA Map Library, the Geodata Server is an interactive computer system that allows a user to search for, browse, and download geographic data.

Subclass - A specific annotation, route, or section feature class within a coverage. For example, a road coverage may have three route-systems stored as subclasses for mail delivery, street cleaning, and garbage pickup.

Theme - A collection of geographic objects defined by the user. Geographic objects are organized logically into groups of layers or themes. Examples of themes include streets, wells, soil types, and streams. In ARC/INFO, themes are represented by a coverage, one of its feature classes, and a set of corresponding attributes; or by another geographic data set such as a grid, image, or tin.

TIFF - Tagged Image File Format.

TIGER - The Topologically Integrated Geographic Encoding and Referencing format used by the U.S. Census Bureau to support census programs and surveys. It was used for the 1990 census. TIGER files contain street address ranges along lines and census tract/block boundaries. These descriptive data can be used to associate address information and census/demographic data to coverage features.

Tile - The spatial unit by which geographic data can be organized, subdivided, and stored in a map library. Tiles subdivide the area covered by a map library and organize the library data by location (e.g., counties might be the tile in a statewide database). A tile can be a regular, geometric shape (e.g., a map sheet), or an irregular shape, such as a county boundary.

Topology - The spatial relationships between connecting or adjacent coverage features.

UTM - Universal Transverse Mercator. - A widely used planar coordinate system, extending from 84 degrees north to 80 degrees south latitude and based on a specialized application of the Transverse Mercator projection.

Vector - A coordinate-based data structure commonly used to represent linear map features. Each linear feature is represented as a list of ordered x,y coordinates. Attributes are associated with the feature (as opposed to a raster data structure, which associates attributes with a grid cell). Traditional vector data structures include double-digitized polygons and arc-node models.